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~~stylus provides the ability to track said motion capabilities
of said stylus by appropriately placed sensors.~~

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8-12

32. A method as recited in Claim 28 wherein said means supportable on a fixed surface and coupled to said stylus provides the ability to track said motion capabilities of said stylus by appropriately placed sensors.

REMARKS

1. Applicant appreciates the Examiner noting the misnumbering of the claims. Applicant has canceled these claims.

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2. The Examiner has stated that feedback means for generating force must be shown for claims 11 and 22 or the feature must be canceled from the claim. Applicant respectfully submits that feedback means are shown.

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Applicant first turns the Examiner's attention to FIG. 1 showing computer 34. Turning to FIG. 3A, the main command loop responds to the host computer and runs repeatedly in the endless cycle. (See Specification page 10, lines 19-21.) FIG. 3A also illustrates how the feedback means operates, that is "[i]f force reflection is supported, these commands will also include reporting the forces felt by any single joint, setting the resistance of any single joint, and locking or unlocking the joint." (Specification, page 11, lines 17-20).

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In furtherance of pointing out to the Examiner that the drawings do indeed show the claimed feedback means Applicant has discovered language in the Specification which had been erroneously added and some which had been erroneously deleted. Applicant has amended the Specification to eliminate the two places on page 13 where it was erroneously stated that

25 force-reflecting hardware is not shown, that is on lines 5 and
lines 15. Moreover, Applicant has inserted into line 20 the
numerical identification of the force generators shown in FIG.
1. That is, the sensors identified therein act as force
generators. Moreover, in FIG. 9, tension spring 56 which is
30 used to apply force, is shown. By applying an electrical
current to certain types of metal alloys springs 56, they act
as actuators. The Specification further states, "[f]orce is
applied for example, by added tension in the joints which is
in proportion to the force being applied by the user and in
35 conjunction with the image of the screen." Accordingly,
Applicant respectfully avers that these amendments do not add
any new matter.

Moreover, on page 13, lines 13-25 describe the
means for feedback involving feedback signals or feedback
40 information. The means for transmission of those signals is
shown in FIG. 1. Applicant has fully described means for
carrying out the invention, that is, adding tension in the
joints.

As 37 C.F.R. 1.83 states, "conventional features
45 disclosed in the description and claims, where their detailed
illustration is not essential for a proper understanding of
the invention, should be illustrated in the drawing in the
form of a graphical symbol or a labeled representation." By
pointing out the block diagram of the computer 34, the
50 algorithms of FIG. 3A, force generators 13A, 13B, 16A, 16B,
19A and 19B and springs 54, Applicant respectfully submits
that Applicant has complied with 37 C.F.R. 1.83 and that the
Examiner's objection thereunder has been overcome.

3. The Examiner has rejected Claims 24 under 35
55 U.S.C. 112, second paragraph. Applicant has amended Claim 24
to reflect its proper dependency and thus has provided "said
remote control unit" with an antecedent basis.

4. The Examiner has rejected Claim 22 under 35 U.S.C. 112, fourth paragraph. Applicant has amended the Claim to reflect its proper dependency and thus it now further limits the subject matter of the previous claim.

5-6. The Examiner has rejected Claims 1-4, 7, 8, 10, 12-15, 18, 19, and 21 under 35 U.S.C. 102(b) as being anticipated by Davis, U.S. Patent No. 4,593,470. Applicant respectfully traverses.

It may be of interest to the Examiner that the Davies patent does not include FIGS. 1 and 2. They may have been lost in filing, so the description is with reference to drawings which are not present.

Before responding to the Examiner's rejections, Applicant would like to point out that Applicant has amended Claims 1 and 12 in two ways to more clearly define the invention. First, Applicant has amended Claims 1 and 12 to reflect more clearly that the stylus locative signal is interactive and is generated on command by the user. See page 7, lines 30-33 through page 8, lines 1-8. Second, Applicant has added language to elaborate on what is meant by "position of the stylus." Applicant has amended Claims 1 and 12 to include that the means supportable on a fixed surface provides the user the ability to manipulate the orientation and location of the stylus and that the stylus locative signal provides information about the orientation and location of the stylus. The terms "orientation and location" is meant to further define "position." Thus, this amendment does not present any new issues. Language for support is found in the Specification on page 5, lines 1-18.

The Examiner has stated that Davies teaches a device for use in a conjunction with a computer display apparatus and a fixed surface, as well as other elements.

Applicant respectfully submits that while Davies shows a stylus for use with a computer, Davies does not show, teach or suggest several features claimed in independent Claims 1 and 12, and thus does not anticipate the present invention.

5 First, Applicant respectfully submits that Davies
does not disclose, teach or suggest an interactive device.
The stylus locative signal of the present invention is
provided to the computer on command. Such provides the
ability of the user to move the cursor on the computer display
10 apparatus, for example. Contrarily, in Davies, there is no
means provided for interactivity of the user with the
computer. The stylus is simply guided along the surface of an
object and the location of the tip of the stylus is reported
to the computer. When the tip is in contact with the surface,
15 the position of the tip is reported. Because Davies provides
no ability for interactivity, Applicant respectfully submits
that in this regard, Davies does not anticipate the present
invention.

20 Second, Davies does not show that the means for
supporting the stylus provides the user the ability to
manipulate the orientation and location of the stylus in
three-dimensional space. Davies only discloses a stylus to
trace along the surface of an object. Column 3, lines 49-51
25 The stylus apparatus which Davies describes could not be used
to carry out the elements of the claims of the present
invention. That is, the configuration shown in Davies could
not provide "a user the ability to manipulate the orientation
and location of said stylus in three-dimensional space."

30 Davies discloses a completely different application
of a support apparatus and stylus than that claimed by
Applicant. Davies describes an articulated arm 16 having
three or four degrees of rotational freedom which only when in
contact the two-dimensional surface of three dimensional

objects within a working volume, provides a signal to the computer display. Column 4, lines 8-12 and Column 4, line 51. (Also see Column 4, lines 18-23 and line 31.) Because Davies only contemplated tracing along the two-dimensional surface of a three-dimensional object, Davies did not contemplate providing the support means with the "ability to manipulate the orientation and location of said stylus in three-dimensional space" as claimed in Claims 1 and 12.

In reviewing the Davies reference, it is clear that Davies did not contemplate a need to provide information in the form of a stylus locative signal about the orientation and location of the stylus, that is, its position. Davies is only concerned with tracing the two-dimensional surface of an object, and therefore Davies did not need to consider the orientation of the stylus.

In the present application, however, as discussed in the Specification, page 5, lines 16-18, "the stylus is moved through space by the user to designate to the computer how or where to move the cursor on a computer display apparatus." The position or orientation of the stylus is necessary in commanding the computer to place or move the cursor in conjunction with a three-dimensional graphics program and provide the claimed interactivity. Davies simply provides a device for reporting the coordinates of a two-dimensional surface to a computer and does not even provide a teaching of the need for a device as claimed in the present application. Three or four degrees of rotation freedom as described by Davies does not provide a sufficient number of degrees of freedom to carry out the present invention and thus does not provide a teaching of the present invention.

One way to look at the difference between the present invention and the Davies device is to imagine that you were to manipulate a stylus to control a simulated screwdriver

in a virtual environment (for training astronauts to repair satellites, for example). With the Davies device you could control the position of the virtual screwdriver but you could not control the orientation of the virtual screwdriver. In other words, you could not tilt the stylus to line up to the screwdriver with the angle of the screw. Also, you could not spin the stylus to screw in the screw. In other words, the Davies device would be completely useless for this application.

There is a very clear distinction between the present invention and the Davies reference. Aside from the fact that the technologies have entirely different purposes, Davies does not so much as contemplate a need to provide the stylus with a sufficient number of degrees of freedom to allow a user to manipulate its orientation and location in three-dimensional space. Davies only discloses three and four degrees of freedom. Davies makes no suggestion as to five or six degrees of freedom, nor would such be obvious from the Davies disclosure because no need is articulated. Because the present invention could not be carried out with a limited number of degrees of freedom in that the stylus could not rotate along its axis, Davies teaches away from the present invention.

Accordingly, Applicant respectfully submits that Applicant has overcome the Examiner's rejections of Claims 1-4, 7, 8, 12-15, 18, 19 and 21 under 35 U.S.C. 102(b) and therefore respectfully requests their allowance.

7. The Examiner has rejected Claims 23, 25, and 26 under 35 U.S.C. 102(b). Applicant has canceled these claims.

8-9. The Examiner has rejected Claims 5, 6, 17 and 24 under 35 U.S.C. 103 as being unpatentable over Davies as

applied to Claims 1, 12 and 21 above, and in further view of IBM Technical Disclosure Bulletin, "Foot-Operated Mouse", Vol. 28, No. 11, April 1986, page 4763. Claim 24 has been canceled. Applicant respectfully traverses.

5 Claims 5, 6 and 17 are dependent upon allowable Claims 1 and 12, and thus Claims 5, 6 and 17 are allowable. Because Davies does not teach an interactive device capable of being manipulated in three-dimensional space, the combination
10 of Davies with the IBM reference does not teach the subject matter of Claims 5, 6 and 17 and therefore these claims are allowable.

Applicant respectfully submits that Applicant has overcome the Examiner's rejection of Claims 5, 6 and 17 and such allowance is respectfully requested.

15 10. The Examiner has rejected Claims 9 and 20 under 35 U.S.C. 103 as being unpatentable over Davies as applied to Claims 1 and 12, and further in view of Duimel, U.S. Patent No. 4,879,556. Applicant respectfully traverses.

20 The Examiner has admitted that Davies does not specifically teach that resistance is provided to the motion of the stylus so he combines Davies with Duimel, a joystick reference, and argues that the combination teaching the present invention. Applicant respectfully submits that since
25 Davies does not teach an interactive device capable of being manipulated in three-dimensional space, the combination of Davies with Duimel does not teach the subject matter of Claims 9 and 20 and therefore these claims are allowable.

30 Applicant respectfully submits that Applicant has overcome the Examiner's rejection of Claims 9 and 20 and such allowance is respectfully requested.

11. The Examiner has rejected Claims 11 and 22 under 35 U.S.C. 103 as being unpatentable over Davies as applied to Claim 1 and further in view of Fisher et al., "Virtual Environment Display System", October 23-24, 1986, all pages.

The Examiner has admitted that Davies does not teach feedback means so he combines Davies with Fisher, a virtual reality system, and argues that the combination teaches the present invention. Applicant respectfully submits that since Davies does not teach an interactive device capable of being manipulated in three-dimensional space, the combination of Davies with Duimel does not teach the subject matter of Claims 11 and 22 and therefore these claims are allowable.

Applicant respectfully submits that Applicant has overcome the Examiner's rejection of Claims 11 and 22 and such allowance is respectfully requested.

12. Applicant has reviewed the prior art and not relied upon and does not find the references pertinent.

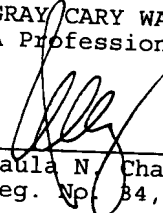
Conclusion

Applicant has amended Claims 1 and 12 to more clearly define the invention. Accordingly, Applicant respectfully submits that there are many elements of the claims which are not disclosed, suggested or taught by the Davies reference. Therefore, Applicant respectfully submits that Davies does not anticipate or make Applicant's invention obvious.

Applicant respectfully submits that the present application is in condition for allowance and such is respectfully requested.

Respectfully submitted,

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